



Climate change affecting temperature and aridity zones: A case study in Eastern Inner Mongolia, China from 1960-2008

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Abstract:

Recent climate change is substantially affecting the spatial pattern of geographical zones, and the temporal and spatial inconsistency of climatic warming and drying patterns contributes to the complexity of the shifting of temperature and aridity zones. Eastern Inner Mongolia, China, located in the interface region of different biomes and ecogeographic zones, has experienced dramatic drying and warming over the past several decades. In this study, the annual accumulated temperature above 10 A degrees C (AAT10) and the aridity index, two key indicators in geographical regionalization, are used to assess warming and drying processes and track the movements of temperature and aridity zones from 1960 to 2008. The results show a significant warming at the regional level from 1960 to 2008 with an AAT10 increase rate of 7.89 A degrees C center dot d/year ($p < 0.001$) in Eastern Inner Mongolia, while the drying trend was not significant during this period. Spatial heterogeneity of warming and drying distributions was also evident. Analysis of warming and drying via piecewise regression revealed two separate, specific trends between the first 31 years (1960-1990) and the subsequent 18 years (1991-2008). Generally, mild warming and very slight wetting occurred prior to 1990, while after 1991 both warming and drying were significant and enhanced. Continuous warming drove a northward shift of temperature zones from the 1960s to 2000s, while aridity zones displayed enhanced temporal and spatial variability. Climate change effects on temperature and aridity zones imply that the patterns of cropping systems, macro-ecosystems, and human land use modes are potentially undergoing migration and modification due to climate change.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Human Conflict/Displacement, Meteorological Factors, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

Climate Change and Human Health Literature Portal



resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: 

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Resource Type: 

format or standard characteristic of resource

Research Article

Timescale: 

time period studied

Time Scale Unspecified